



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/674,224

09/29/2003

Jose M. Sosa

API- 1018-US

2510

25264

7590

07/25/2007

FINA TECHNOLOGY, INC  
PO BOX 674412  
HOUSTON, TX 77267-4412

EXAMINER

ASINOVSKY, OLGA

ART UNIT

PAPER NUMBER

1711

MAIL DATE

DELIVERY MODE

07/25/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

---

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

**MAILED**  
**JUL 25 2007**  
**GROUP 1700**

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/674,224  
Filing Date: September 29, 2003  
Appellant(s): SOSA ET AL.

---

Tenley R. Krueger  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed April 05, 2007 appealing from the Office action mailed April 03, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

4,125,695	Kamath	11-1978
4,861,827	Sosa et al.	08-1989

5,428,106

Schrader et al.

06-1995

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-6, 8-9, 13-15, 22, 25 and 27 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kamath U.S. Patent 4,125,695.

Claim 1 discloses a process for producing a high impact polystyrene comprising admixing a rubber and styrene monomer in the presence of at least two polymerization initiators and polymerizing the styrene monomer wherein at least one initiator is a grafting initiator and at least one other initiator of said at least two polymerization initiators is a non-grafting initiator.

Claim 25 (independent) discloses a process for producing a high impact polystyrene comprising: admixing a rubber and styrene monomer in the presence of at

Art Unit: 1711

least two polymerization initiators selected to optimize a high impact polystyrene morphology, wherein at least one of the at least two polymerization initiators is a grafting initiator and at least one of the at least two polymerization initiators is a non-grafting initiator, and polymerizing the styrene to form the high impact polystyrene.

Claim 27 (independent) discloses a process for producing a high impact polystyrene comprising admixing a rubber and styrene monomer in the presence of at least two polymerization initiators and polymerizing the styrene monomer wherein at least one of the at least two polymerization initiators is a grafting initiator and at least one of the at least two polymerization initiators is a non-grafting initiator selected from the group consisting of 2,2'-azobis(isobutyronitrile), 2,2'-azobis(2-methylbutyronitrile), lauroyl peroxide, decanoyl peroxide, and mixture thereof.

Kamath discloses a process for the free radical polymerization of vinyl monomers including styrene monomer containing dissolved elastomer for producing high impact polystyrene, column 17, lines 46-48. An elastomer is readable as a rubber in the present claims 1, 3, 25 and 27. The polymerization process is a continuous process in solution using ethylbenzene as the solvent in the presence of the initiator system containing at least two initiators, col. 3, lines 1-8; col. 14, lines 64-68; col. 19, line 30-31 and 36, for the present claims 1, 5-6, 13, 25 and 27. Ethylbenzene solvent acts as a chain transfer agent in the polymerization of styrene, col. 19, lines 36-37, for the present claims 5-6 and 22. One type of an initiator is peroxy-containing initiator, columns 7-8. Other type of initiators is polyfunctional initiator including azo-bis-isobutyronitrile, col. 6,

lines 1-15. In the working example 7 at column 12, a difunctional azo initiator in combination with peroxide initiators has been used. In the working example 5 at column 11, initiators are initiator containing azo group and other initiator is a benzoyl peroxide that have been used. Kamath discloses an initiator system comprising at least two types of initiators. The organic peroxide initiator such as 1,1-bis(t-butylperoxy)cyclohexane or ethyl-3,3 bis (t-butylperoxy)-butyrate is readable in the present claims 8-9 for being the grafting initiator, column 8, lines 12 and 27. The azo-group containing initiator such as ethylene-bis(4-t-butylazo-4-cyanovalerate or azo-bis-isobutyronitrile are readable for being a "non-grafting initiator," column 8, line 11 and column 6, line 15.

Kamath does not use term a "non-grafting initiator," however, (for example) the azo-bis-isobutyronitrile initiator is readable in the present claim 27 for being a non-grafting initiator. The other initiators such as lauroyl peroxide and decanoyl peroxide, col. 6, lines 5-6, are also readable for being non-grafting initiators in the present claim 27. In the process for producing high impact polystyrene, Kamath discloses grafting reactions, the level of grafting can be increased, column 3, lines 14-15. The molecular weight-average molecular weight of polystyrene is in the range of 200,000 to 350,000, col. 4, lines 40-41. The concentration of di- or poly-functional initiator is preferably from 10 to 90%, col. 6, lines 66-68. Kamath discloses a mixture of at least two initiators, column 5, line 8 and 63-65. Kamath discloses two-stage polymerization process, the first stage of the polymerization was done at 90C and the second stage at 120 C, col. 9, lines 16-20, for the present claims 14-15. The statement in the present claim 25 wherein "initiators

Art Unit: 1711

selected to optimize a high impact polystyrene morphology” is inherent in Kamath invention because Kamath discloses at least two initiators having different half-lives decompose temperature, and the resulting product is high impact polystyrene having high molecular weight. The term “optimize morphology” says nothing to polymer morphology. There is no process condition how to optimize the morphology of the resulting HIPS. It is reasonably to presume that the selected “grafting initiator” and a “non-grafting initiator” in the present claims to “optimize a high impact polystyrene morphology” would possess the same properties for high impact polystyrene using the initiator system in Kamath invention, because Kamath discloses an organic peroxide initiator in combination with difunctional azo initiator, that are readable in the present claims. It is burden on the applicants to provide the difference in order to overcome this rejection under *In re Fitzgerald* 205 USPQ 594.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-5, 8-9, 13-20 and 24-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Sosa et al U.S. Patent 4,861,827.

Sosa discloses a continuous polymerization of high impact polystyrene using a combination of initiators including organic peroxy-containing compound and azo-

Art Unit: 1711

containing compound, col. 3, lines 57-59 and col. 5, lines 42-68, for the present claims 1, 24, 25 and 27. Sosa'827 does not use phrase "non-grafted initiator", however, the azo-containing initiator such as 2,2'-azo-bisisobutyronitrile is readable for being a non-grafting initiator in the present claims 1, 25 and 27, column 5, lines 42-44 and 55. The organic peroxide initiator such as 1,1-di(t-butylperoxy)cyclohexane (column 5, line 64) is readable for being a graft initiator for the present claims 1, 8-9, 25 and 27. The continuous polymerization process can be carried out in the presence of solvent, col. 2, line 38, for the present claim 5. Any morphology structure of the resultant HIPS could be obtained in Sosa'827. The term "optimize" a high impact polystyrene morphology in the present independent claim 25 is meaningless, because term "optimize" morphology does not have the definition of the desired morphology. There is no process condition in the process claims how to control morphology of the resulting HIPS. Case law holds that while the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Geuns*, 988 F.2d 1181, 26 USPQ 2d 1057 (Fed.Cir. 1993). The high impact polystyrene morphology comprises honeycomb structures in the present claim 26 would be expected in Sosa'827 because Sosa discloses the same graft initiator and the same non-grafting initiator, and the same high impact polystyrene. The invention as claimed, therefore, is fully anticipated by the disclosure of the Sosa'827 reference.



***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 6-7, 12, 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sosa et al U.S. Patent 4,861,827 as applied to claims 1, 3-5, 8-9, 13-20 and 24-27 above, and further in view of Schrader et al U.S. Patent 5,428,106.

Sosa '827 does not disclose a chain transfer agent and a solvent specified in the present claims 2 and 6.

Schrader discloses a rubber-modified monovinylidene aromatic polymer produced in a solution polymerization of styrene monomer in the presence of rubber particle, of ethyl benzene diluent, an initiator and chain transfer agent, col. 4, lines 13-66; col. 5, lines 20-65; col. 10, lines 27-41. The combination of initiator and chain transfer agent serves as the dominant factor in controlling the rubber morphology and the rubber particle sizes, col. 10, lines 38-41.

It would have been obvious to one of ordinary skill in the art to modify the process for producing HIPS in Sosa'827 by adding a chain transfer agent, solvent and any conventional additives as disclosed by Schrader, because Sosa disclose the solution polymerization process for obtaining HIPS and the other additives (Sosa'827, col. 2, line 39) can include a chains transfer agent as a beneficial agent for controlling the rubber

particle size and the rubber morphology within the rubber-modified styrene resin,  
Schrader, col. 5, lines 57-58.

### **(10) Response to Argument**

The grounds of the rejections set forth above are based on rejections of the office action mailed on 04/03/2006.

(i) Appellant's argument is that Kamath does not teach the use of a grafting initiator in combination with a non-grafting initiator, Appellant's Argument at page 4. Kamath discloses a wide variety of poly-functional free radical initiators wherein an initiator mixture can be used for producing a high impact polystyrene, column 5, lines 5-15 and column 6, lines 1-19. A grafting initiator is defined in the present claim 8. A non-grafting initiator is defined in the present claim 27. Kamath does disclose that known monofunctional azo and peroxide free radical initiators can be used in the practice of his invention, as components of an initiator mixture or combination where at least one component is a polyfunctional free radical initiator, column 5, lines 63-67. The organic peroxide initiator such as 1,1-bis(t-butylperoxy)cyclohexane or ethyl-3,3 bis (t-butylperoxy)-butyrate is readable in the present claims 8-9 for being the grafting initiator. The azo-group containing initiator such as ethylene-bis(4-t-butylazo-4-cyanovalerate or azo-bis-isobutyronitrile are readable for being a "non-grafting initiator." Kamath does not use term a "non-grafting initiator," however, the azo-bis-isobutyronitrile initiator is readable in the present claim 27 for being a non-grafting initiator, column 6, line 15. In Kamath invention in the working example 7 at column 12 a difunctional azo

Art Unit: 1711

initiator, R-A76 was used in combination with peroxide initiators in the bulk polymerization of styrene. At column 8, line 11, the R-A76 is ethylene-bis(4-t-butylazo-4-cyanovalerate); and at column 8, line 13, the peroxide initiator LUPERSOL 331 is 1,1-bis(t-butylperoxy)-cyclohexane. Kamath does disclose the combination of two different types of initiators.

There is no Appellant's argument that the azo-group containing initiator in Kamath invention is not qualified to as a non-grafting initiator. Claim may be differently worded but having the same meaning.

(ii) Appellant's argument is that Sosa' 827 "nowhere teaches or suggested combination of a grafting initiator and a non-grafting initiator, such initiators selected to optimize a high impact polystyrene morphology, as recited in pending claim 25," in Appellant's Arguments at page 6. The term "optimize" morphology does not have any direction or definition how to optimize a morphology for obtaining the desired property of the resulting of high impact polystyrene. There is no characteristic for a desired morphology of HIPS. There is no process condition how to control or regulate the morphology for HIPS in the present claims. There is no desired property of the resulting HIPS. Sosa' 827 does disclose a combination of at least two initiators. The amount of free radical initiator to be used is from 10 to 2000 ppm, preferably 50 to 600 ppm, based on the total content of the polymer system in the first polymerization reactor, column 6, lines 2-5, for the present claim 17.

Art Unit: 1711

Appellant argues that Sosa' 827 teaches that "peroxy free-radical initiators are a useful class of initiators for such process, but that acidic decomposition by-products of such peroxy free-radical initiators produce the undesirable effects which the present invention is intended to alleviate," Appellant's Argument at page 5, last paragraph. This argument is not persuasive. Any peroxy free-radical initiators are readable in the present independent claims. A ratio of grafting to non-grafting initiator is from about 1:10 to about 10:1 (present claim 18). The claimed process does not claim how to control the acidic decomposition of peroxy free-radical initiators.

(iii) Appellant's argument at page 6, paragraph III is that Schrader does not supply the features missing in Sosa. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case Sosa' 827 discloses a styrene-rubber solution for a continuous phase polymerization process, column 2, line 62. The solvent such as ethyl benzene (for the present claim 6) is readable in Schrader invention. A chain transfer agent is expected in Sosa' 827 invention to control the molecular weight and rubber particle size. Schrader

Art Unit: 1711

discloses cellular rubber morphology-based HIPS resin, column 12, lines 60-61. The analogous initiator such as 1,1-di(t-butylperoxy)cyclohexane, column 11, line 59, can be selected. Schrader discloses high impact polystyrene resin (HIPS). Schrader does teach to use a solvent and a chain transfer agent for producing HIPS.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.


For the above reasons, it is believed that the rejections should be sustained.

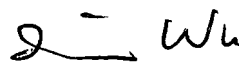
Respectfully submitted,

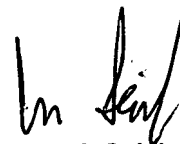
  
Olga Asinovsky

July 18, 2007

Conferees:

  
James Seidleck

  
David Wu

  
James J. Seidleck  
Supervisory Patent Examiner  
Technology Center 1700